石川県金沢市の中部中新統犀川層から産出したフジイマツ

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Mariko Yamada and Toshihiro Yamada*: ***Pinus fujiii* (Yasui) Miki from the Middle Miocene Saikawa Formation in Kanazawa, Ishikawa Prefecture, Japan**
山田茉莉子・山田敏弘：石川県金沢市の中部中新統犀川層から産出したフジイマツ

Pinus fujiii (Yasui) Miki (Pinaceae) is a fossil species endemic to Japan and found from the Lower Miocene to Lower Pleistocene deposits (ca. 17 to 1.75 Ma: Yamada et al. 2014). *Pinus fujiii* is considered to be a species belonging to the subsection *Pinus* (section *Pinus*, Subgenus *Pinus*) based on spur shoot and cone morphologies: a pair of leaves is enclosed in the persistent sheath and umbo of cone scales has a mucro at the upper-center (perexcentromucronate) (Yamada et al. 2014). Recently, it is proposed that *P. fujiii* is a possible ancestor of extant Japanese Black Pine (*Pinus thunbergii* Parl.), because these two species share medially positioned resin ducts in leaves (Yamada et al. 2014).

Although there are many Upper Pliocene to Lower Pleistocene records of *P. fujiii*, the late Middle to Late Miocene records only come from the Seto and the Tokiguchi Porcelain Clay formations of the Seto Group which are distributed in Aichi and Gifu prefectures, respectively (Yasui 1928; Miki 1939, 1941, 1957; Yamada et al. 2014).

Here we report cones of *P. fujiii* from the Saikawa Formation in Kanazawa-shi, Ishikawa Pref., Japan. The age of the Saikawa Formation is estimated as 13.17–11.03 Ma based on calcareous nannofossils (Takayama et al. 1988), thus slightly older than those of the Seto and the Tokiguchi Porcelain Clay formations (10.5 ± 0.4–9.7 ± 0.4 Ma: Saneyoshi et al. 2000). This is the first finding of late Middle Miocene *P. fujiii* from the deposits other than the Seto Group.

***Pinus fujiii* (Yasui) Miki 1939**

Pinites fujiii Yasui 1928 (Pl. 20–21, Text-fig. 12).

Pinus fujiii (Yasui) Miki 1939 (name only); Miki 1941 (Pl. 4, G; Fig. 5K-L); Miki 1948 (list only); Miki 1957 (Pl. 7, H–K); Tanai 1961 (Pl. 2, Fig. 9; non Pl. 3, Fig. 10); Kimura et al. 1981 (Pl. 9, Figs. 2, 3; Text-figs. 2a-c).

Pinus miocenica Tanai, Matsuo 1963 (pl. 43, Fig. 5); Ina 1981 (Pl. 2, Fig. 1).

Locality: Riverbed of Sai River in Okuwa (Onma)-cho, Kanazawa-shi, Ishikawa Pref., Japan (N36°31′41.9″ E136°41′4.4″).

Fossil horizon: late Middle Miocene Saikawa Formation (ca. 13–11 Ma)

Repository: Osaka Museum of Natural History. OSA TB9000 (Figs. 1A, B); OSA TB9001 (Fig. 1C); OSA TB9002 (Fig. 1D); OSA TB9003 (Fig. 1E)

Description: Mature female cones conical to ovoid, ca. 70 mm long x 20–30 mm wide (Figs. 1A–C). Cone bases cordate (Figs. 1A, C). About sixty cone scales arranged in 5+8 parastichy (Figs. 1A, E). Apophyses rhombic, moderately swollen, and 8–12 mm wide x 5–8 mm high at the middle of the cone (Figs. 1A, D). Apophysis with an umbo on the dorsal side, a weak transverse keel, and weak vallum (Figs. 1A, B). Umbo rhombic to elliptic, 1.8–2.6 mm wide x 1.4–2.0 mm high, located at one-half to one-third from the upper corner of the apophysis (Fig. 1B). Lower half of the umbo depressed (Fig. 1B). Obtusely pointed mucro at the upper-center (perexcentromucronate) of the umbo (Fig. 1B). Immature female cone ovoid, 19 mm long x 12 mm wide, with a convex base (Fig. 1E).

Remarks: Our specimens are also similar to *Pinus premassoniana* Su-Ting Ding and Bai-Nian Sun from the upper Miocene of Zhejiang Province, China in umbo characters (Ding et al. 2013). However, these could be distinguished from *P. premassoniana* in having a weak transverse keel and a vallum.

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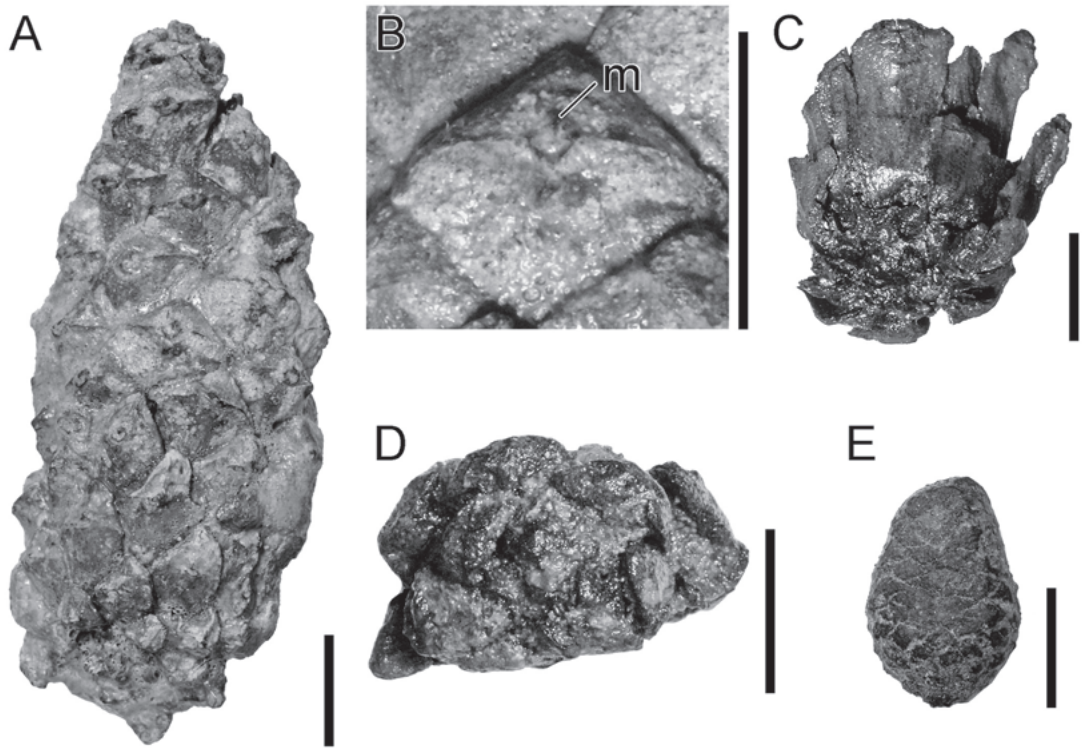

Fig. 1. *Pinus fujiii* cones from the Saikawa Formation. **A.** Lateral view showing general morphology. OSA TB9000. **B.** Close-up of an umbo in A. **C.** Lateral view of OSA TB9001. **D.** Apical view of OSA TB9002. **E.** Immature cone. OSA TB9003. m, mucro. Bar = 1cm A, C-E and 5mm in B.

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